frame extracting means for buffering [and amplifying] compressed digital data input thereto, and extracting specific data for a speed-varied reproduction from said compressed digital data;

frame recording position controlling means for calculating [the] a number of tracks for recording the compressed digital data[,] and selectively outputting a [buffed] buffered [and amplified] output, [and] said extracted specific data from said frame extracting means, and [outputting] a multiplexing timing signal;

frame position information recording means for recording position information of specific tracks for [a] the speed-varied reproduction and index information on a magnetic tape, based on said multiplexing timing signal;

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digital recording means for recording [said] digital signals including said digital data and said index information on said magnetic tape;

digital reproduction means for reproducing the digital signals recorded on the magnetic tape;

frame position information detecting means for detecting said position information of the specific tracks for the speed-varied reproducing and said index information;

tape speed controlling means for controlling the speed of a capstan motor, based on said detected index information and said position information of the specific tracks; and

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frame removing means for receiving [therein] an [said] output from the digital reproduction means and removing unnecessary bit streams from the specific data.

Claim 2 (Amended)

An apparatus in accordance with claim 1, wherein said frame extracting means comprises:

an interface for receiving said compressed digital data;

a buffer [adapted to buffer] for buffering an output of said interface [and thereby amplify] for a predetermined period;

a frame detector [adapted to] for [detect] detecting said specific data from said output of the interface and outputting a write enable signal; and

a frame memory [adapted to] for selecting and [store] storing the detected specific data, based on said write enable signal.

Claim 3 (Amended)

An apparatus in accordance with claim 2, wherein said frame detector [is adapted to] counts [the] a number of frames when a frame mark code is detected from a bit stream of said output of the interface, and [to] enables said write enable signal when said counted number of frames is determined to be the same as [the] an interval number [of specific frames repeated] at which I-frames are present.

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Claim 4 (Amended)

An apparatus in accordance with claim 1, wherein said frame recording position controlling means comprises:

a track number calculator [adapted to] for [operate] calculating an average bit rate of said compressed digital [signals] data, [and] the size of the specific data[, thereby calculating the], a number of tracks for [the] recording said specific data and [the] a number of tracks present between said specific tracks;

a multiplexing timing generator [adapted to] for [receive] receiving an output from said track number calculator and outputting a switching signal for positioning the specific data on said specific tracks in accordance with a head switching signal;

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a multiplexer [adapted to] for selecting an output from said frame extracting means, based on an output from said multiplexing timing generator and sending said selected output [it] to said digital recording means; and

a bit stuffing circuit [adapted to] for filling insufficient data with bit streams or dummy bits when said selected output of the frame extracting means is at an underflow state.

Claim 5 (Amended)

An apparatus in accordance with claim 1, wherein said frame position information recording means comprises:

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a frame position recorder [adapted to] for [receive] receiving [said] an output from said frame recording position controlling means [multiplexing timing generator] and [thereby] outputting position discrimination information to said digital recording means so as to record position information of a next specific track on [the] an initial synchronous block of a [the] track having [recorded with] said specific data recorded thereon; and

an index signal recorder [adapted to] for [receive said position discrimination information and thereby] recording position information of said track [recorded with the] having said specific data recorded thereon on [said] a control track of said magnetic tape by an index head.

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Claim 6 (Amended)

An apparatus in accordance with claim 1, wherein said frame position information detecting means comprises:

an index signal detector [adapted to] for detecting index information recorded on [said] a control track of said magnetic tape [and indicative of], said index information indicating whether tracks [of] recorded with said specific data are present[, by use of an index head];

a recording position-synchronized block detector [adapted to] for detecting [said] an output from said digital reproduction means and [thereby] detecting recording position-synchronized

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blocks recorded with codes indicative of relative position information of said tracks recorded with said specific data; and

a recording position decoder [adapted to] for [decode] decoding an output of said recording position-synchronized block detector, based on a number of different tape speeds [speed multiple], and thereby outputting a signal for calculating[ion of] a capstan servo speed.

Claim 7 (Amended)

An apparatus in accordance with claim 1, wherein said tape speed controlling means comprises:

a capstan servo speed calculator [adapted to] for [calculate] calculating a capstan servo speed for repeating a [normal speed travel and a high speed travel on said specific tracks in a speed-varied reproducing of specific track position information and track position information for said specific data from said frame position information detecting means based on a speed multiple] normal speed travel on said specific tracks and a high speed travel on tracks between adjacent specific tracks in a speed-varied reproduction by using the position information of the specific track from said frame position information detecting means based on a number of different tape speeds; and

a capstan servo drive signal generator [adapted to] for controlling driving of said capstan motor, based on an output of said capstan servo speed calculator.

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Claim 8 (Amended)

An apparatus in accordance with claim 1, wherein said frame removing means comprises:

a deformatter [adapted to] for converting [said] an output of said digital reproduction means to a signal form prior to recording;

a stuffing bit-detecting and removing circuit [adapted to] for outputting a bit removing signal to said deformatter and [thereby remove] removing stuffing bits or dummy bits added for preventing generation of an underflow of said frame extracting means in the speed-varied reproduction; and

a frame removal timing generator [adapted to] for [receive] receiving said [specific track] position information of the specific tracks from said frame position information detecting means and outputting a frame removing signal to the deformatter, based on a head switching signal, thereby preventing outputting of said specific data [for the varied speed] in a normal-speed reproduction.

Please add the following new claims:

-- 9. An apparatus in accordance with claim 1, wherein said specific data includes I-frames.

10. An apparatus in accordance with claim 1, wherein said digital recording means and said digital reproduction means include

a plurality of heads and switches for selectively recording and reproducing the digital signals.

11. An apparatus for controlling recording in a video cassette tape recorder comprising:

frame extracting means for receiving compressed digital data input thereto and extracting specific data for a speed-varied reproduction from said compressed digital data;

frame recording position controlling means for generating a multiplexing timing signal and multiplexing said compressed digital data and said extracted specific data from said frame extracting means based on said multiplexing timing signal;

frame position information recording means for recording index information and position information of specific tracks for recording said specific data for the speed-varied reproduction on a magnetic tape based on said multiplexing timing signal; and

digital recording means for recording digital signals including said digital data and specific data from said frame recording position controlling means on the magnetic tape.

12. An apparatus in accordance with claim 11, wherein said frame extracting means includes:

an interface for receiving said compressed digital data;

a buffer for buffering an output of said interface for a predetermined period;

a frame detector for detecting said specific data from said output of the interface and outputting a write enable signal; and

a frame memory for selecting and storing said specific data based on said write enable signal.

13. An apparatus in accordance with claim 12, wherein said frame detector starts counting frames when a frame mark code is detected from a bit stream of said output of the interface, and enables said write enable signal when said counted frame number equals an interval number at which I-frames are present.

14. An apparatus in accordance with claim 11, wherein said frame recording position controlling means includes:

a track number calculator for calculating a number of said specific tracks for recording said specific data and a number of tracks present between said specific tracks;

a multiplexing timing generator for generating said multiplexing timing signal based on an output from said track number calculator; and

a multiplexer for selecting an output from said frame extracting means based on said generated multiplexing timing signal.

15. An apparatus in accordance with claim 14, wherein said frame recording position controlling means includes a bit stuffing

circuit for filling insufficient data with bit streams or dummy bits when said selected output of the frame extracting means is at an underflow state.

16. An apparatus in accordance with claim 11, wherein said frame position information recording means includes:

a frame position recorder for receiving an output from said frame recording position controlling means and outputting position discrimination information to said digital recording means so as to record said position information of said specific tracks; and

an index signal recorder for recording said index information on a control track of the magnetic tape, said index information including information indicating whether said specific tracks for said specific data are present.

17. An apparatus in accordance with claim 11, wherein said specific data includes I-frames, and said digital recording means includes a plurality of heads and switches for selectively recording said digital signals.

18. An apparatus in accordance with claim 11, wherein said digital recording means includes an interleaving and channel driving circuit, a plurality recording formatters, and a plurality of channel modulators, for formatting said digital signals so as to record said digital signals on the magnetic tape.

19. An apparatus for controlling reproduction in a video cassette tape recording comprising:

digital reproduction means for reproducing digital signals recorded on a magnetic tape, said digital reproduction means including a capstan motor;

frame position information detecting means for detecting position information of specific tracks on the magnetic tape and index information of the specific tracks, said specific tracks carrying specific data for a speed-varied reproduction;

tape speed controlling means for controlling a speed of said capstan motor based on the detected index information and position information of the specific tracks; and

frame removing means for removing said specific data from said reproduced digital signals so as to output a speed-varied reproduced signal.

20. An apparatus in accordance with claim 19, wherein said frame position information detecting means includes:

an index signal detector for detecting said index information recorded on a control track of the magnetic tape;

a recording position-synchronized block detector for detecting from an output of said digital reproduction means, recording position-synchronized blocks including said position information of the specific tracks; and

a recording position decoder for decoding an output of said recording position-synchronized block detector based on a number of different tape speeds to calculate the speed of said capstan motor.

21. An apparatus in accordance with claim 19, wherein said tape speed controlling means includes:

a capstan servo speed calculator for calculating a capstan servo speed for repeating a first speed travel and a second speed travel on said specific tracks in the speed-varied reproduction, based on the detected index information and position information of the specific tracks and a speed multiple; and

a capstan servo drive signal generator for controlling driving of said capstan motor based on said calculated capstan servo speed.

22. An apparatus in accordance with claim 19, wherein said frame removing means includes:

a deformatter for converting an output of said digital reproduction means to output said speed-varied reproduced signal;

a stuffing bit-detecting and removing circuit for outputting a bit removing signal to said deformatter to remove stuffing bits or dummy bits recorded on the magnetic tape; and

a frame removal timing generator for receiving said position information of the specific tracks from said frame position information detecting means and outputting a frame removing signal

to said deformatter so as to prevent outputting of said specific data.

23. An apparatus in accordance with claim 19, wherein said specific data includes I-frames, and said digital reproduction means includes a plurality of heads and switches for selectively reproducing said digital signals.

19.
24. A method for controlling recording and reproduction in a video cassette tape recorder, comprising the steps of:

extracting specific data for a speed varied reproduction from compressed digital data;

calculating a number of tracks for recording said digital data and outputting a multiplexing timing signal based on said calculated number of tracks;

recording position information of specific tracks for the speed varied reproduction and index information on a magnetic tape based on said multiplexing timing signal;

recording digital signals including said digital data and said index information on the magnetic tape;

reproducing said digital signals recorded on the magnetic tape;

detecting said position information of the specific tracks for the speed varied reproduction and said index information;

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controlling the speed of a capstan motor based on said detected index information and position information of the specific tracks; and

removing unnecessary bit streams from said specific data.

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~~25.~~ A method in accordance with claim ~~24~~, wherein said specific data includes I-frames.

21.
~~26.~~ A method of controlling recording in a video cassette tape recorder, comprising the steps of:

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extracting specific data for a speed-varied reproduction from compressed digital data;

generating a multiplexing timing signal and multiplexing said compressed digital data and said extracted specific data based on said multiplexing timing signal;

recording index information and position information of specific tracks for recording said specific data for the speed-varied reproduction on a magnetic tape based on said multiplexing timing signal; and

recording digital signals including said multiplexed digital data and specific data on the magnetic tape.

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~~27.~~ A method in accordance with claim ~~26~~, wherein said generating step includes calculating a number of tracks for

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recording said digital data and generating said multiplexing timing signal based on said calculated number of tracks.

28. A method of controlling reproduction in a video cassette tape recording, comprising the steps of:

reproducing digital signals recorded on a magnetic tape;

detecting position information of specific tracks on the magnetic tape and index information of the specific tracks, said specific tracks carrying specific data for a speed-varied reproduction;

controlling the speed of said capstan motor based on the detected index information and position information of the specific tracks; and

removing said specific data from said reproduced digital signals to output a speed-varied reproduced signal.

REMARKS

Claims 1-28 are pending in the present application. New claims 9-28, directed to an apparatus and method for controlling recording and/or reproduction in a video cassette tape recorder, are presented herewith.

Applicants wish to thank the Examiner for a telephone interview conducted with the Examiner on October 4, 1995. During the interview, the Examiner has indicated that the subject matter of claims 1-8 is allowable over the prior art of record.